

CLEAN VERSION OF THE CLAIMS

10. A method for reducing a subterranean aqueous fluid flow into a well drilled through a hydrocarbon-bearing formation, comprising the following steps:

providing a composition comprising water soluble hydrophobically-modified polymers having a linear hydrophilic backbone with hydrophobic side groups located at random positions along said backbone and functional groups for cross-linking said polymers;

allowing said composition to contact the formation; and

cross-linking said hydrophobically-modified polymers of the composition to form a cross-linked gel selectively reducing said subterranean aqueous fluid flow.

11. The method of claim 10, wherein the polymers comprise 0.5 to 5 mole per cent of hydrophobic side groups.

12. The method of claim 10, wherein the functional groups for cross-linking form part of the hydrophilic backbone of the polymer.

13. The method of claim 10, wherein the functional groups for cross-linking form part of the hydrophobic side groups.

14. The method of claim 10, wherein the polymers have a molecular weight of 50,000 or more.

15. The method of claim 10, wherein the hydrophilic backbone of the hydrophobically modified polymers comprises poly(acrylic acid), poly(vinylpyridine), hydroxyethylcellulose or poly(ethylene oxide).
16. The method of claim 10, wherein the hydrophobically modified polymers comprise poly(sodium 4-styrenesulphonate) or poly(vinylpyridine).
17. The method of claim 10, wherein the hydrophobically-modified polymers comprise poly(acrylamide).
18. The method of claim 10, wherein the hydrophobically-modified polymers comprise n-nonyl acrylate.
19. The method of claim 10, wherein the hydrophobically-modified polymers comprise N-decylamide.
20. The method of claim 10, wherein the composition further comprises a chemical cross-linking agent.
21. The method of claim 20, wherein the chemical cross-linking agent is organic.
22. The method of claim 20, wherein the chemical cross-linking agent comprises formaldehyde or phenol.
23. The method of claim 20, wherein the chemical cross-linking agent is an aldehyde or an aldehyde derivative comprising at least 5 carbon atoms.
24. The method of claim 23, wherein the chemical cross-linking agent is hexanal or heptanal.
25. The method of claim 10, wherein the gel is stable.

26. The method of claim 10, wherein the hydrophobically-modified polymers are prevented from cross-linking in contact with hydrocarbons.
27. The method of claim 26, wherein the cross-linking agent is removed from the composition by solubilization in the contacting hydrocarbons.
28. The method of claim 26, wherein the composition partly solubilizes hydrocarbons.